UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
LSASD/HWSB/HWSS
2890 Woodbridge Avenue, Edison, NJ 08837

EXECUTIVE NARRATIVE

Case No.: 49917
Site: New Cassel/Hicksville Ground Water Contamination
Number of Samples: 10 (GW), 4 (FB), 2 (TB)
Analysis: TVOA, TVOA-SIM (MA # 3138.0)

SDG No.: BGJN1
Laboratory: Analytical Resource, LLC
Sampling dates: 04/04/2022 - 04/05/2022
Validation SOP: QA-HWSS-A-004 (Rev 0)

QAPP:
Contractor: HDR APTIM
Reference: DCN: 10256504-0, April 2022

SUMMARY OF DEFINITIONS:
Critical: Results have an unacceptable level of uncertainty and should not be used for making decisions. Data have been qualified "R" rejected.
Major: A level of uncertainty exists that may not meet the data quality objectives for the project. A bias is likely to be present in the results. Data has been qualified "J" estimated. "J+" and "J-" represent likely direction of the bias.
Minor: The level of uncertainty is acceptable. No significant bias in the data was observed.

Critical Findings:
None

Major Findings:
The following samples have analytes that have been qualified "J", "J+" or "J-".
TVOA: BGJN1, BGJN7, BGJN8, BGJN9, BGJP0, BGJP7, BGJP8
TVOA-SIM: None

Minor Findings:
TVOA/TVOA-SIM: One or more analytes in one or more samples are qualified "J" due to results between MDL and CRQL.

COMMENTS: Per request in ARF, Summary Reports were created without project action levels.

Reviewer Name(s): Diptiben Varamora and Reginald St-Juste

Approver's Signature:

Date: 05/17/2022

Name: **Narendra Kumar**

Affiliation: USEPA/R2/HWSB/HWSS

Data Qualifier Definitions (National Functional Guidelines)			
Qualifier Symbol	**Explanation**		
	INORGANICS	**ORGANICS**	**CHLORINATED DIOXIN/FURAN**
U	The analyte was analyzed for, but was not detected above the level of the reported quantitation limit.	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted Contract Required Quantitation Limit (CRQL) for sample and method	The analyte was analyzed for but not detected. The value preceding the "U" may represent the adjusted Contract Required Quantitation Limit (see DLM02.X, Exhibit D, Section 1.2 and Table 2), or the sample specific estimated detection limit (EDL, see Method 8290A, Section 11.9.5).
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL.	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to an issue with the quality of the data generated because certain QC criteria were not met, or the concentration of the analyte was below the adjusted CRQL).
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.	
J–	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.	
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.	The analyte was not detected (see definition of "U" flag, above). The reported value should be considered approximate.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
N		The analysis indicates the presence of an analyte for which there is presumptive evidence to make a “tentative identification”.	
NJ		The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	
C		This qualifier applies to pesticide and Aroclor results when the identification has been confirmed by Gas Chromatograph/Mass Spectrometer (GC/MS).	
X		This qualifier applies to pesticide and Aroclor results when GC/MS analysis was attempted but was unsuccessful.	

DATA ASSESSMENT

ANALYSIS: TVOA /TVOA-SIM (MA 3138.0)

The current SOP QA-HWSS-A-004 (Rev 0) March 2022, USEPA Region II for the evaluation of Trace Volatile organic data, and all related Change Request Forms (CRF) for this SOP, generated through Statement of Work SFAM01.1, and any future editorial revisions of SFAM01.1 has been applied. Data have been reviewed according to TDF specifications, the National Functional Guidelines Report and the CCS Semi-Automated Screening Results Report. Tentatively Identified Compounds (TICs) for TVOA organic fraction is not validated.

1. HOLDING TIME AND PRESERVATION:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those detected and non-detected analytes in the samples whose holding time has been exceeded will be qualified as per Table 2 of QA-HWSS-A-004 (Rev 0). Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

2. DEUTERATED MONITORING COMPOUNDS (DMC's):

All samples are spiked with DMC compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured DMC recovery limits were outside the specified limits in Table 10 of SOW SFAM01.1 (Exhibit D, trace level volatile analysis, Section 17), qualifications were applied as per Table 8 of the SOP QA-HWSS-A-004 (Rev 0) to all the samples and analytes as shown below.

TVOA:

The following samples have DMC percent recoveries less than the primary minimum criteria but greater than or equal to the expanded minimum criteria. Detects are qualified as estimated J-. Non-detects are qualified as estimated UJ.

Chloroethane-d5 BGJN1, BGJN9
Dichlorodifluoromethane, Chloromethane, Bromomethane, Chloroethane, Carbon disulfide

Chloroform-d BGJN9
1,1-Dichloroethane, Bromochloromethane, Chloroform, Dibromochloromethane, Bromoform

trans-1,3-Dichloropropene-d4 BGJN9
cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, 1,1,2-Trichloroethane

The following samples have DMC percent recoveries above the upper limit of the criteria window. Detected compounds are qualified J+. Non-detected compounds are not qualified.

trans-1,3-Dichloropropene-d4 BGJN0, BGJP7
cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, 1,1,2-Trichloroethane

1,2-Dichlorobenzene-d4 BGJP2
Chlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, 1,2,4-Trichlorobenzene, 1,2,3-Trichlorobenzene

TVOA-SIM:

The following samples have DMC percent recoveries less than the primary minimum criteria but greater than or equal to the expanded minimum criteria. Detects are qualified as estimated J-. Non-detects are qualified as estimated UJ.

1,2-Dichloroethane-d4 BGJN1RE, BGJN1, BGJN4, BGJN4RE, BGJN9RE, BGJP3, BGJP5RE, BGJP5, BGJP6, BGJP6RE, BGJP7RE, BGJP7
Trichlorofluoromethane, 1,1,2-Trichloro-1,2,2-trifluoroethane, Methyl acetate, Methylene chloride, Methyl-tert-butyl ether, 1,1,1-Trichloroethane, Carbon tetrachloride, 1,2-Dibromoethane, 1,2-Dichloroethane

Vinyl chloride-d3 BGJN1RE, BGJN1
Vinyl chloride

The following sample has DMC percent recoveries greater than the primary maximum criteria. Detects are qualified as estimated J+. Non-detected are not qualified.

Vinyl chloride-d3 BGJP1
Vinyl chloride

3. MATRIX SPIKE/ MATRIX SPIKE RECOVERY:

MS/MSD data is generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other QC criteria for additional qualification of data.

Not applicable

4. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Depending on the amount of contamination present in the QA blanks, the analytes are qualified as per Table 7 of SOP QA-HWSS-A-004 (Rev 0).

A) Method blank contamination:

TVOA:

No problems were found for this criterion.

TVOA-SIM:

The following samples have analyte results reported less than CRQLs. The associated method blank results are less than CRQLs. Detects are qualified U. Sample results have been reported at CRQLs.

cis-1,3-Dichloropropene BGJN0, BGJN1, BGJN4, BGJN7, BGJN9, BGJP1RE, BGJP3RE, BGJP5, BGJP6, BGJP7

B) Field or rinse blank contamination: BGJN6, BGJN8, BGJP2, BGJP4

TVOA:

The following samples have common laboratory contaminant analyte results reported less than CRQLs. The associated Field Blank result is less than CRQLs. Detects are qualified U. Non-detected compounds are not qualified. Sample results have been reported at CRQLs.

Acetone BGJN1, BGJN9

The following sample has common laboratory contaminant analyte results reported greater than or equal to CRQLs but less than 2X Blank Result. The associated Field Blank result is less than CRQLs. Detects are qualified U. Non-detected compounds are not qualified. Sample results have been reported at CRQLs.

Acetone BGJN4

The following samples have analyte results reported less than CRQLs. The associated Field Blank result is less than CRQLs. Detects are qualified U. Non-detected compounds are not qualified. Sample results have been reported at CRQLs.

2-Hexanone BGJN7

Tetrachloroethene BGJP1

The following samples have analyte results reported less than CRQLs. The associated Field Blank result is greater than or equal to the CRQLs. Detects are qualified U. Non-detected compounds are not qualified. Sample results have been reported at CRQLs.

Acetone BGJN0, BGJP3, BGJP6, BGJP7

The following sample has common laboratory contaminant analyte concentrations reported greater than or equal to the CRQL but less than 2X blank result. The associated Field blank result is greater than or equal to the CRQL. Reported concentrations of the analyte in the samples have been qualified U. Non-detected compounds are not qualified.

Acetone BGJP1

TVOA-SIM:

The following samples have analyte results reported less than CRQLs. The associated field blank results are less than CRQLs. Detects are qualified U. Sample results have been reported at CRQLs.

cis-1,3-Dichloropropene BGJN0, BGJN1, BGJN4, BGJN7, BGJN9, BGJP1RE, BGJP3RE, BGJP5, BGJP6, BGJP7

C) Trip blank contamination: BGJP0, BGJP8

TVOA:

The following sample has analyte results reported less than CRQLs. The associated Trip Blank results are less than CRQLs. Detects are qualified U. Non-detected compounds are not qualified. Sample results have been reported at CRQLs.

Tetrachloroethene BGJN7

TVOA-SIM:

The following samples have analyte results reported less than CRQLs. The associated trip blank results are less than CRQLs. Detects are qualified U. Sample results have been reported at CRQLs.

cis-1,3-Dichloropropene BGJN0, BGJN1, BGJN4, BGJN7, BGJN9, BGJP1RE, BGJP3RE, BGJP5, BGJP6, BGJP7

D) Storage Blank associated with TVOA samples only:

TVOA:

The following samples have analyte results reported greater than or equal to 2x Blank Results. The associated storage blank results are less than CRQLs. Detects are not qualified.

Methylene chloride BGJP5, BGJP6

TVOA-SIM:

The following samples have analyte results reported less than CRQLs. The associated storage blank results are less than CRQLs. Detects are qualified U. Sample results have been reported at CRQLs.

cis-1,3-Dichloropropene BGJN0, BGJN1, BGJN4, BGJN7, BGJN9, BGJP1RE, BGJP3RE, BGJP5, BGJP6, BGJP7

E) Tentatively Identified Compounds:

Tentatively Identified Compounds (TICs) for TVOA organic fraction are not validated.

5. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene. If the mass calibration

is in error, all associated data will be classified as unusable "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. All analytes for initial, ICV and continuing calibration should meet the minimum RRF criteria as listed in Table 4 of SOW SFAM01.1 (Exhibit D, trace level volatile analysis, Section 17). If RRF is less than minimum RRF specified in the Table 4, all detects in the sample will be qualified as estimated "J" and non-detects for that compound will be rejected "R". Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration.

Percent RSD must be less than maximum %RSD in Table 4 of SOW SFAM01.1 (Exhibit D, trace level volatile analysis, Section 17) for all target analytes. For the opening or closing CCV %D must be within the inclusive opening or closing maximum %D limits as listed in Table 4 of SOW SFAM01.1 (Exhibit D, trace level volatile analysis, Section 17) for all Target compounds. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are qualified as estimated, "J" and Non-detects are qualified "UJ" for %D values outside criteria only. If %RSD exceeds QC criteria, detects are qualified as "J" and non-detects are not qualified. Qualifications were applied to the samples and analytes as shown below.

The following analytes in the sample shown were qualified for %RSD and %D:

The following samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detects are qualified as estimated J. Non-detects are not qualified.

Dibromochloromethane BGJN1, BGJN4, BGJN6, BGJN7, BGJN8, BGJN9, BGJP0

1,2-Dibromoethane BGJN1, BGJN4, BGJN6, BGJN7, BGJN8, BGJN9, BGJP0

The following samples are associated with an opening CCV with % Difference exceeding criteria. Detects are qualified as estimated J. Non-detects are qualified as estimated UJ.

trans-1,3-Dichloropropene BGJN0DL, BGJP3DL, BGJP4RE, BGJP5DL, BGJP6DL, BGJP7DL, BGJP8

Dibromochloromethane BGJN0DL, BGJP3DL, BGJP4RE, BGJP5DL, BGJP6DL, BGJP7DL, BGJP8

The following samples are associated with a closing CCV with % Difference exceeding criteria. Detects are qualified as estimated J. Non-detects are qualified as estimated UJ.

Acetone BGJN1, BGJN4, BGJN6, BGJN7, BGJN8, BGJN9, BGJP0

7. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count and retention time must be in the range as specified in Table 10 of SOP QA-HWSS-A-004 (Rev 0) of the associated continuing calibration internal standard area. If the internal standard area count and retention time were outside the specified limits in Table 10 of SOP QA-HWSS-A-004 (Rev 0), qualifications will be applied to the results for compounds quantitated with that IS as per Table 10 of SOP QA-HWSS-A-004 (Rev 0). Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

8. FIELD DUPLICATES: BGJP5 and BGJP6

No problems were found for this criterion.

9. COMPOUND IDENTIFICATION:

Target compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within a window of 0.06 RRT units of the standard compound and have ion spectra which has a ratio of the primary and secondary m/z intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications. Qualifications were applied to the samples and analytes as shown below.

No problems were found for this criterion.

10. CONTRACT PROBLEMS NON-COMPLIANCE:

Initial calibration percent relative standard deviation (%RSD) is outside criteria for the following analytes.
Dibromochloromethane
1,2-Dibromoethane

11. FIELD DOCUMENTATION:

No problems were identified.

12. OTHER PROBLEMS:

TVOA:
None

TVOA-SIM:
The following samples were not analyzed at initial dilution due to high concentration of non-target SIM analytes detected during full scan TVOA analysis.

BGJN0, BGJN1, BGJN4, BGJN9, BGJP3RE, BGJP5, BGJP6, BGJP7

TVOA-SIM was analyzed under MA# 3138.0. However, Laboratory data package did not include the copy of MA# 3138.0

13. DILUTIONS, RE-EXTRACTIONS & REANALYSIS:

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used. See summary report and EDD for applicable samples and analytes.

TVOA:
The following dilution samples were only used for one or more analytes.
BGJN0DL, BGJN1DL, BGJN4DL, BGJN9DL, BGJN9DL, BGJP3DL, BGJP5DL, BGJP6DL, BGJP7DL

The following samples have initial and or re-analysis. Using professional judgement, best results were reported.
BGJP4, BGJP4RE

The following initial analysis and/or re-analysis sample was not used.
BGJP4RE

TVOA-SIM:
The following samples have initial and or re-analysis. Using professional judgement, best results were reported.
BGJN4, BGJN6, BGJN7, BGJN8, BGJN9, BGJP0, BGJP1RE, BGJP2RE, BGJP4, BGJP8

The following initial analysis and/or re-analysis samples were not used.
BGJN0, BGJN1, BGJP3RE, BGJP5, BGJP6, BGJP7